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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/604,748	08/14/2003	Anthony Mantone	131219MG	1747

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EXAMINER	
FETZNER, TIFFANY A	
ART UNIT	**PAPER NUMBER**
2859	

DATE MAILED: 08/23/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/604,748	MANTONE ET AL.	
	Examiner	Art Unit	
	Tiffany A Fetzner	2859	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *14 August 2003*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-25* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-25* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☒ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *14 August 2004* is/are: a)☐ accepted or b)☒ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☒ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☒ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Oath/Declaration

1. The oath or declaration is defective. A new oath or declaration in compliance with 37 CFR 1.67(a) identifying this application by application number and filing date is required. See MPEP §§ 602.01 and 602.02.

The oath or declaration is defective because:
It was not executed in accordance with either 37 CFR 1.66 or 1.68 because the oath/declaration filed 08/14/2003 does not include a **legible/viewable applicant's signature**, or **a legible/viewable date** of execution

Drawings

2. The drawings are objected to as failing to comply with 37 CFR 1.84(p)(5) because they do not include the following reference sign(s) mentioned in the description:

A) In **figure 2 component 100** that is taught on page 9 paragraph [0016] line 1, as a component of figure 2, is not shown.

B) **Component 210** is not shown in **Figure 3**, or **Figure 4** however this component is taught on page 12 the last line through page 13 line 1, therefore it must be shown in the figure or figures which require this component. Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The replacement sheet(s) should be labeled "Replacement Sheet" in the page header (as per 37 CFR 1.84(c)) so as not to obstruct any portion of the drawing figures. If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

3. The drawings are objected to as failing to comply with 37 CFR 1.84(p)(4) because reference character "212" has been used to designate an "inner gradient coil" {See page 10 paragraph [0018] line 4} "conductive strips" {See page 10 paragraph [0019] line 4, and "a hollow conductor" {See page 10 paragraph [0019] lines 12-13}. The examiner notes that if applicant desires each of these component labels to be

synonymous with component number "212" that applicant needs to refer to all related synonyms at the point in the specification where component number 212 is first referred to (i.e. Applicant should insert a sentence clarifying the terms for component 212 on page 9 paragraph [0017] line 4, prior to the sentence which begins with the word "**Working**". Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The replacement sheet(s) should be labeled "Replacement Sheet" in the page header (as per 37 CFR 1.84(c)) so as not to obstruct any portion of the drawing figures. If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

Specification

4. The **abstract** of the disclosure is objected to because the abstract has five and a half extraneous lines of text which appear to be a computer path, Please delete the path "shapeTypezozfFlipHofFlipvolTxid6ss36dxTextLeftodyTextTopod xTex tRightodyTextBottomoWrapTextIfFitshapeToTextofFilledofLineow zNamesWFootpgggposrelhlposrelvlfBehindDocumentofLayoutInceII1N:ïDOCSï12812ï03813ïBP0309.DOCN:ïDOCSï12812ï03813 ïBP0309.DOC." Correction is required. See MPEP § 608.01(b).

Claim Rejections - 35 USC § 102

5. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

6. **Claims 1, 2, 8, 9, 15,** and **20-25** are rejected under **35 U.S.C. 102(b)** as being anticipated by **Damadian et al.**, US patent 6,369,571 issued April 9th 2002, filed May 10th 2001.

7. With respect to **Claim 1**, **Damadian et al.**, teaches and shows "A transverse gradient coil" [See Figures 17A, 17B, 17C and 17E; col. 22 lines 8-47 especially col. 22 lines 25-29 "comprising: a strip of electrically conductive material; [See the coil windings which are wound tubular strips, of col. 22 lines 25-29; col. 21 line 56 through col. 22 line 47] "and said strip of electrically conductive material having a hollow portion such that fluid is permitted to flow through the conductive material." [See col. 23 lines 19-22; col. 23 line 36 through col. 24 line 2]

8. With respect to **Claim 8**, **Damadian et al.**, teaches and shows "An MRI apparatus comprising: a magnetic resonance imaging system (MRI)" [See figure 2] "having a plurality of gradient coils positioned about a bore of a magnet to impress a polarizing magnetic field" [See components 45 in figure 2; figures 17A through 17E col. 8 lines 47-56] "and an RF transceiver system and an RF switch controlled by a pulse mode to transmit RF signals to an RF coil assembly to acquire MR images;" [See col. 10 lines 15-30] "an input device to select a scan sequence";(i.e. the computer control) [See col. 10 lines 15-30] "and wherein a gradient coil is wound of a hollow conductor elements such that fluid is permitted to flow through the conductor." [See col. 7 lines 1-18; col. 23 line 36 through col. 24 line 2]

9. With respect to **Claim 15**, **Damadian et al.**, teaches and shows "A gradient coil assembly comprising: a strip of conductive material;" (i.e. a metallic bar) [See col. 7 lines 1-9; col. 21 line 56 through col. 22 line 47; figure 2 component 45; figures 17A through 17E; col. 8 lines 47-56] "said strip of conductive material being formed into a cylindrical coil winding;" (i.e. the metallic or copper bar is formed into a tubular/cylindrical winding) [See col. 7 lines 1-9; col. 21 line 56 through col. 22 line 47; figure 2 component 45; figures 17A through 17E; col. 8 lines 47-56] "said winding including a continuous tubular hollow area through the winding, said hollow area permitting the continuous flow of coolant." [See components 45 in figure 2; figures 17A through 17E col. 8 lines 47-56; col. 7 lines 1-18; col. 23 line 36 through col. 24 line 2]

10. With respect to **Claim 20**, **Damadian et al.**, teaches and shows "A transverse gradient coil assembly comprising: a cylindrical inner coil winding" [See col. 7 lines 1-9; col. 21 line 56 through col. 22 line 47; figure 2 component 45; figures 17A through 17E;

col. 8 lines 47-56], "said winding further including a continuous tubular hollow area through the winding, said tubular area permitting the continuous flow of coolant;" [See components 45 in figure 2; figures 17A through 17E col. 8 lines 47-56; col. 7 lines 1-18; col. 23 line 36 through col. 24 line 2] "a filler material surrounding the coil winding;" (i.e. insulation such as dielectric tape.) [See col. 22 lines 39 –67] "and a plurality of coolant pipes situated in thermal contact with the gradient coil in the filler material." [See col. 22 lines 39 through col. 24 line 2; figures 17D and 17E where the hose fittings for each inlet and outlet of each conductor connects to a source which pipes in the flowing water coolant.]

11. With respect to **Claim 22**, **Damadian et al.**, teaches and shows "A method for cooling a gradient coil assembly comprising the steps of: providing a conductor having a continuous hollow center; winding the conductor into a spiral such that said conductor forms a cylinder; providing a cooling system for circulating a coolant through the hollow area in the inner gradient coil." [See col. 7 lines 1-18; col. 21 line 56 through col. 22 line 47; figure 2 component 45; figures 17A through 17E; col. 8 lines 47-56; col. 23 line 36through col. 24 line 2.]

12. With respect to **Claim 2**, **Damadian et al.**, teaches and shows " the hollow conductor is wound in a helix to form the general shape of a cylinder." [See figures 17A and 17B; col. 7 lines 1-18] The same reasons for rejection, that apply to **claim 1** also apply to **claim 2** and need not be reiterated.

13. With respect to **Claim 9**, **Damadian et al.**, teaches that " the hollow conductor is wound to comprise a transverse coil." [See col. 22 lines 25-29] The same reasons for rejection, that apply to **claim 8** also apply to **claim 9** and need not be reiterated.

14. With respect to **Claim 21**, **Damadian et al.**, teaches and shows "a plurality of hollow conductor sections, each permitting fluid to flow through the hollow conductor." [See Figures 17A through 17E; figure 2 component 45; col. 23 line 36 through col. 24 line 2; col. 7 lines 1-18] The same reasons for rejection, that apply to **claim 18** also apply to **claim 21** and need not be reiterated.

15. With respect to **Claim 23**, **Damadian et al.**, teaches and shows "locating the wound cylindrical conductor in coaxial relationship with other cylindrical windings." [See

Figures 17A through 17E, figure 2; col. 22 lines 48-67; col. 24 lines 13-29] The same reasons for rejection, that apply to **claim 22** also apply to **claim 23** and need not be reiterated.

16. With respect to **Claim 24**, **Damadian et al.**, shows positioning the "windings in a radially spaced-apart coaxial relationship." [See Figures 17A through 17E, figure 2; col. 24 lines 13-29] The same reasons for rejection, that apply to **claims 22, 23** also apply to **claim 24** and need not be reiterated.

With respect to **Claim 25**, **Damadian et al.**, teaches and shows " the step of circulating coolant through said coil windings." [See col. 23 line 36 through col. 24 line 2; col. 7 lines 1-18.] The same reasons for rejection, that apply to **claims 22, 23, 24** also apply to **claim 25** and need not be reiterated.

Claim Rejections - 35 USC § 103

17. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

18. The factual inquiries set forth in *Graham* **v.** *John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

19. **Claims 3-7, 10-14** and **16-19** are rejected under **35 U.S.C. 103(a)** as being unpatentable over **Damadian et al.**, US patent 6,369,571 issued April 9th 2002, filed May 10th 2001.

20. With respect to **Claim 3**, and **corresponding claims 10** and **16** which depend respectively from **claims 1, 8,** and **15**; **Damadian et al.**, lacks directly teaching that "the hollow conductor is wound for use in a shielded coil" directly. However, **Damadian et al.**, teaches that the individual windings are desirably covered with insulation such as dielectric tape; [See col. 22 lines 39-41] that the flowing cooling fluid through the hollow windings helps dissipate heat produced when the windings are active, [See col. 22 lines 1-4] and teaches that the ability to provide high coolant flows with reasonable pressures facilitates maintaining the conductor coil windings at a reasonable temperature, [See col. 23 lines 52-55]. Therefore it would have been obvious to one of ordinary skill in the art at the time that the invention was made that the wound hollow conductor windings which comprise the **Damadian et al.**, coil system and are coaxially wound, [See figures 17A through 17E] provide, or are used as, a shielded transverse [See col. 22 lines 25-26] coil system. The same reasons for rejection, that apply to **claims 1, 2, 8, 9,** and **15** also apply to **claim 3** and need not be reiterated.

21. With respect to **Claim 4**, and **corresponding claims 11** and **17** which depend respectively from **claims 1, 8,** and **15**; **Damadian et al.**, teaches and shows "The transverse gradient coil assembly of claim 3 wherein the gradient coil is comprised of a plurality of hollow conductor sections, each permitting fluid to flow through the conductor." [See Figures 17A through 17E; figure 2 component 45; col. 23 line 36 through col. 24 line 2; col. 7 lines 1-18] The same reasons for rejection, that apply to **claims 1, 2, 3, 8, 10, 15 ,16** and the reasons for obviousness, that apply to **claims 3, 10**, and **16** also apply to **claims 4, 11,** and **17** and need not be reiterated.

22. With respect to **Claim 5**, and **corresponding claim 12** which depend respectively from **claims 1,** and **8**; **Damadian et al.**, shows that "the hollow conductor is wound for use in a flat gradient coil, for use in an open architecture Magnetic Resonance Imaging device." [See Figure 2 component 45, and figures 17A, 17B, 6, and 7 which show an open MRI device with flat gradient coils and flat wound coils.] The same reasons for rejection, that apply to **claims 1, 2, 3, 4, 8, 10, 11, 15 ,16, 17** and the reasons for obviousness, that apply to **claims 3, 10**, and **16** also apply to **claims 5,** and **12** and need not be reiterated.

23. With respect to **Claim 6**, and **corresponding claims 13** and **18** which depend respectively from **claims 1, 8,** and **15**; **Damadian et al.**, teaches and suggests that additional cooling is provided by a plurality of coolant pipes situated in thermal contact around the coil" windings. [See col. 28 lines 27 to 53 where the additional fluid cooling device is interpreted as suggesting additional coolant piping means beyond the inlet and outlet piping conduits taught to coil the coils earlier in the reference.] The same reasons for rejection, that apply to **claims 1, 2, 3, 4, 5, 8, 10, 11, 12, 15 ,16, 17** and the reasons for obviousness, that apply to **claims 3, 10**, and **16** also apply to **claims 6, 13,** and **18** and need not be reiterated.

24. With respect to **Claim 7**, and **corresponding claims 14** and **19** which depend respectively from **claims 1, 8,** and **15**; **Damadian et al.**, teaches that "the coolant passed through the tubular area is water, ethylene glycol or a mixture of the two coolants." [See col. 22 lines 1-7 and col. 28 lines 29-32.] The same reasons for rejection, that apply to **claims 1, 2, 3, 4, 5, 6, 8, 10, 11, 12, 13, 15 ,16, 17, 18** and the reasons for obviousness, that apply to **claims 3, 10**, and **16** also apply to **claims 7, 14,** and **19** and need not be reiterated.

Prior art of Record

25. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

A) **Doty et al.,** US patent 5,886,548 issued March 23rd 1999.

B) **Heid** US patent application publication 2003/0218460 A1 published November 27th 2003, with an effective US filing date of April 11th 2003.

C) **Vavrek et al.,** US patent 5,304,933 issued April 19th 1994.

D) **Damadian et al.,** US patent 6,445,186 B1 issued September 3rd 2002; filed May 10th 2001.

E) **Damadian et al.,** US patent 6,469,508 B1 issued October 22nd 2002; filed May 10th 2001.

F) **Damadian et al.,** US patent 6,496,007 B1 issued December 17th 2002; filed May 10th 2001.

G) **Damadian et al.,** US patent 6,335,623 B1 issued January 1st 2002; filed November 25th 1998.

H) **Wollin** US patent 6,452,390 B1 issued September 17th 2002, filed November 15th 2000.

I) **Herd et al.,** US patent 5,774,032 issued June 30th 1998.

J) **Lew** US patent 4,901,018 issued February 13th 1990.

K) **Marshall** US patent 3,412,320 issued November 19th 1968.

Conclusion

26. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Tiffany Fetzner whose telephone number is: (571) 272-2241. The examiner can normally be reached on Monday-Thursday from 7:00am to 4:30pm., and on alternate Friday's from 7:00am to 3:30pm.

27. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Diego Gutierrez, can be reached at (571) 272-2245. The **only official fax phone number** for the organization where this application or proceeding is assigned is **(703) 872-9306**.

TAF
August 19, 2004

Diego Gutierrez
Supervisory Patent Examiner
Technology Center 2800